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EXAMINER

DALEY, CHRISTOPHER ANTHONY

ART UNIT

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2111

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---|--|--|
| Office Action Summary | Application No. 10/810,026 | Applicant(s) MUNGUIA, PETER R. | |
| | Examiner CHRISTOPHER A. DALEY | Art Unit 2111 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7,8,10,12-15,17,18,22,23 and 25-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-5,7-8,10,12-15,17-18,22-23,25-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-5, 7, 8, 10, 12-15, 17, 18 and 22-29 are presented for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 10-14, 25 - 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent 6,185,692 granted to Wolford in view of Lee et al (US5815734) hereinafter Lee in further view of Culbert et al (US6820209) hereinafter Culbert.

4. As per claims 1, and 25, the reference of Wolford teaches an apparatus comprising:

A variable speed bus (Fig. 1, element 20) & col. 3, lines 6-19; a first unit coupled to the variable speed bus (Fig. 1); a second unit coupled to the variable speed bus (Fig. 1);

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and "an arbitration and a bus clock control unit" in col. 3, lines 6-19, 37-42; col. 4, lines 6-12, 34-41 and 62-66.

The reference of Wolford does not expressly show "change of clock frequency based on access request rate". However, the above feature was well known in the data processing art at the time the invention was made as evidenced by Lee. The reference of Lee teaches the feature in col. 5, lines 31-59. Figure 2 of Lee illustrates a bus interface unit that upon request, enable a higher frequency bus operation. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Wolford to implement the above feature of Lee to obtain the claimed invention because this is straightforward possibility known in the art from which one of ordinary skill in the art at the time the invention was made would select in accordance with circumstances without the exercise of inventive skill so as to allow the system of Wolford to be compatible with a widely used standard and to allow the system to take advantage of the many benefits provided by the feature such as improved performance while conserving power by reducing power consumption of the system, COL. 3, lines 1 – 12.

Wolford as modified by Lee does not explicitly disclose wherein the arbitration and bus clock control unit to track a rate of request of the first and second units to access the variable speed bus, the arbitration and the bus clock control unit is further to instruct a clock throttling logic to adjust a clock frequency associated with the variable speed bus according to bandwidth requirements of the first and second units based on the rate of the request.

However, Culbert teaches wherein the arbitration and bus clock control unit to track a rate of request of the first and second units to access the variable speed bus, the arbitration and the bus clock control unit is further to instruct a clock throttling logic to adjust a clock frequency associated with the variable speed bus according to bandwidth requirements of the first and second units based on the rate of the request as illustrated in Figure 2. Said figure illustrates a clock controller 218, and arbitration unit 208. Arbitration of access to the local memory 202 takes place. This arbitration is between the 2D and 3D graphics engine. The monitors signal status, indicate which clock, both ck1, and ck2 should be used, COL. 6, lines 44 – 67.

It would have been obvious to one of ordinary skill in the art at the time of the invention to manage the power consumption of the system, COL. 2, lines 1 – 10. One of ordinary skill in the art would have been motivated to use the control system of Culbert in the system of Wolford/Lee to manage the power consumption of the system, COL. 2, lines 1 - 10.

Woodford as modified by Culbert and Lee does not explicitly teach modified to recognize when there are no incoming requests and a percentage of arbitration slots that are being used.

However, Barr teaches a frequency manager that recognizes when there are no incoming requests and a percentage of arbitration slots that are being used as illustrated in Figure 2. In said figure is illustrated a frequency manager that comprises interconnection to devices within the system via bus 202. Based on the interconnect

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load, frequency calculator determines the clock speed via clock generator 212 page 3, paragraph 0037.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the power management scheme of Barr in the system of Woodford/Culbert/Lee as it provides said system with a methodology to dynamically manage the system's thermal requirements, page 2, paragraph 0014. One of ordinary skill in the art would have been motivated to use the power management scheme of Barr in the system of Woodford/Culbert/Lee as it provides said system with a methodology to dynamically manage the system's thermal requirements, page 2, paragraph 0014.

Barr teaches the adjusting of the clock frequency includes lowering the clock frequency to a lowest level necessary in accordance with the recognition of no incoming requests and the percentage of the arbitration slots being used (Figure 1B with frequency manager 158 used to adjust include lowering clock frequency dependent on the load, page 4, paragraph 0044).

5. As per claims 2, 26, the reference of Wolford teaches that the first unit is a processing unit (Fig. 1, CPU 12).

6. As per claims 3, and 27, the reference of Wolford teaches that the second unit is a video processing unit (Fig. 1, graphics 21).

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7. As per claims 4, and 28, the reference of Wolford teaches that the first unit is a hard disk drive controller unit (Fig. 1, SCSI 18).

8. As per claim 10, the limitations of the claim are similar to claim 1. Therefore, the claim is rejected for similar reasons as discussed in the rejection of claim 1 above.

As per claim 11, the reference of Wolford teaches the added limitation of the claim in col. 3, lines 6-19, 37-42; col. 4, lines 6-12, 34-41 and 62-66.

9. As per claims 12-14, the claims are rejected for the same reasons as discussed in the rejection of claims 2-4 respectively.

10. Claims 22-23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent 6,185,692 granted to Wolford in view of Lee, and further in view of US Patent Application Publication US 20050044442 (Barr et al.).

11. As per claim 22, the limitations of the claims are rejected for similar reasons as discussed in the rejection of claim 11 above with the exception of the added limitation, "change of clock frequency based on bandwidth requirement". However, one of ordinary skill in the art at the time the invention was made would have recognized that different types of devices might have different bandwidth requirements. The reference of Barr et al. teaches a system for adjusting a variable speed bus (PCI bus) depending on

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bandwidth requirements of the attached devices [para. 0053]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Wolford and Barr et al. to obtain the claimed invention because they both teach a system for adjusting a variable speed bus.

12. As per claim 23, the reference of Wolford teaches the variable speed bus, the first unit, the second unit, the clock throttling logic and the arbitration and clock control unit are located on a single semiconductor die in Fig. 1.

13. Claims 5, 7, 8, 15, 17 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over US Patent 6,185,692 granted to Wolford in view of Lee, and in further view of Culbert, and further in view of common knowledge in the data processing art at the time of the invention with and without the patent granted Keeley (US5844794).

14. As per dependent claims 5, 7, 8, and 29, the claims are rejected for the same reasons as discussed in the rejection of claim 1 with the exception of claiming various alternatively useable units for isochronous data transfer. The examiner takes Official Notice that the claimed features were well known in the data processing art at the time the invention was made with and without the patent granted Keeley (US5844794) which teaches data processing of isochronous traffic. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Wolford in view of Lee

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to implement the above features to obtain the claimed invention because these are straightforward possibilities from which one of ordinary skill in the art at the time the invention was made would select in accordance with circumstances without the exercise of inventive skill so as to allow the system of Wolford in view of Lee to be compatible with a widely used standard and to allow the system to take advantage of the many benefits provided by those features.

15. As per claims 15, 17 and 18, the claims are rejected for the same reasons as discussed in the rejection of claims 5, 7 and 8 respectively.

Response to Arguments

16. Applicant's arguments with respect to claims 1, 10, and 25 have been considered but are moot in view of the new ground(s) of rejection. With regards to the Applicant's claim that prior art does not disclose

Claim 1, as amended, further recites "arbitration and bus clock control unit is further modified to recognize when there are no incoming requests and a percentage of arbitration slots that are being used, and to instruct a clock throttling logic to adjust a clock frequency associated with the variable speed bus according to bandwidth requirements of the first and second units based on the rate of request, the adjusting of the clock frequency includes lowering the clock frequency to a lowest level necessary in accordance with the recognition of no incoming requests and the percentage of the arbitration slots being used". (emphasis added).

In response, the Examiner points to the teaching of Barr. Barr teaches a frequency manager that recognizes when there are no incoming requests and a percentage of arbitration slots that are being used as illustrated in Figure 2. In said figure is illustrated a frequency manager that comprises interconnection to devices within the system via bus 202. Based on the interconnect load, frequency calculator determines the clock speed via clock generator 212 page 3, paragraph 0037.

Barr teaches the adjusting of the clock frequency includes lowering the clock frequency to a lowest level necessary in accordance with the recognition of no incoming requests and the percentage of the arbitration slots being used (Figure 1B with frequency manager 158 used to adjust include lowering clock frequency dependent on the load, page 4, paragraph 0044). Therefore, the examiner cannot allow the claim, since the prior art discloses the element.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER A. DALEY whose telephone number is (571)272-3625. The examiner can normally be reached on 9 am. - 4p m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Rinehart can be reached on 571 272 3632. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher A Daley/
Examiner, Art Unit 2111

/Khanh Dang/
Primary Examiner, Art Unit 2111